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NPIC/TDS-155/67
30 August 1967

MEMORANDUM FOR: Executive Director, NPIC

25X1A

SUBJECT : [redacted] Chip Comparators, History and TDS Actions

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1. On 28 June 1963 the Agency entered into a Fixed Price R&D contract with [redacted] for the design and fabrication of a prototype stereo viewing chip comparator, model 405A. This contract was sponsored by TDS from R&D funds amounting to [redacted] On 22 July 1964 the comparator was delivered and then accepted shortly thereafter. 25X1A

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2. On 22 June 1964 the Agency entered into a Fixed Price Incentive contract with [redacted] for three model 405B Chip Comparators, which was subsequently amended in 1965 to include two additional chip comparators (the model 405B is essentially an improved version of the 405A). The funding (not R&D) and requirements for all five 405B chip comparators came from the operating divisions. All five comparators were subsequently delivered but only the first unit delivered in November of 1965 was ever completely installed in IAS and checked out. As a result of the failure of the interferometers on the 405A prototype and equally poor results on the 405B production model when installed, none of the 405B's have been formally accepted by NPIC from [redacted] 25X1A

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3. As a result of the unacceptable performance of the comparators, a letter was sent t[redacted] on 8 July 1966, expressing our concern on the performance of the chip comparators up to that time. On 22 July 1966 [redacted] sent NPIC a letter outlining the corrective actions they intended taking, and during this time period the 405A prototype machine was returned to [redacted] to be retrofited with the improvements already contained in the 405B's. (The funded modifications on the prototype 405A did not include any interferometer improvements by the manufacturer.) The original prototype 405A was again delivered by the manufacturer and is now in IAS. (IAS today has two machines in-house.) 25X1A

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4. In October of 1966 [redacted] of this staff was assigned the problem of monitoring the efforts to make the comparators operationally acceptable. On 28 October 1966 he visited [redacted] to review the work they were doing on the interferometers and the following agreements were made. 25X1A

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a. The minimum acceptable time period between routine maintenance was to be two weeks with a goal of one month.

25X1A b. Since [redacted] had the 405A comparator there for modifications at that time (the 405B's had been delivered to NPIC) it was used as a test-bed for the interferometers for the 405B's.

On the 3rd and 4th of January 1967 the 405A (M) comparator (the 'M' stands for the latest modification to the prototype) was tested prior 25X1A to shipping and within the test period performed satisfactorily. [redacted] was therefore authorized to ship it and it was delivered 25X1A and installed in [redacted] on the 27th of January. During February 1967 this comparator was left largely at the disposal of L&S to evaluate and work out operational problems. By the 1st of March it was apparent that the original prototype 405A (M) had deteriorated beyond an acceptable level of performance and [redacted] was called 25X1A to repair same. Since then an extensive evaluation program has been conducted to determine the source of the problem, with [redacted] 25X1A spending 39 man days in our facility to analyze and correct the problem. The primary source of failure of the 405A (M) was traced to Radio Frequency interference between the two interferometers unique to all of the chip comparators (405A and B). While other problem areas have been found they are not as critical as the radio frequency problem. Since the problem area has been isolated, two of the 405B comparators 25X1A have been returned to [redacted] for retrofit and analysis, in the 25X1A meantime, [redacted] is giving us full cooperation in keeping the 405A (M) in operational shape at NPIC while they continue their factory analysis. They are now completing the modifications on the two 405B's and will start extensive testing which they hope to complete by mid-September. If successful, the remaining three 405B's will then be retrofited to the same standards.

5. The following additional factors have also affected the development of the comparators.

a. The original specifications for the 405A called for a 3" x 3" measuring stage. It was subsequently agreed to increase this to 4¼" x 4¼" but this was never specified contractually even though funding was provided in a subsequent amendment. The original project engineer left [redacted] and the new engineers 25X1A were not aware of this commitment. There is, however, little question as to the comparator's performing reliability over the 3" x 3" format.

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b. At the time the comparators were delivered, we had no test and evaluation capability in-house and left this function up to the operating division.

c. An NPIC Photo Chip position has never been established.

d. Considerable difficulties have been encountered by the operating divisions in getting the necessary computer support for Real-Time processing. Frequently when the machine was operational it was impossible to get computer support. Progress has recently been made in this area although concern still exists whether the latest type of photo imagery can be exploited effectively with this equipment.

e. The 409B chip comparator is possibly the most precise piece of film mensuration equipment in existence, and as a result, is extremely sensitive to a variety of environmental conditions.

f. The basic problem with the chip comparators is in the interferometers which are a proprietary item for which [redacted] 25X1A
25X1A [redacted] has patent rights. Bringing in another company to tackle the problem was considered, but due to the possible legal repercussions it was decided to delay any such action until all
25X1A possibilities with [redacted] had been exhausted.

6. On the 28th of August [redacted] 25X1A were consulted concerning the Chip Comparators and both verified that they have current operational requirements for the comparators. In addition, they also have long range requirements for a chip comparator of increased flexibility.

7. In order to achieve a better understanding of the problem, 25X1A [redacted] has been requested to give a presentation concerning their position. They have agreed to make the presentation in [redacted] 25X1
25X1 [redacted] on 6 September 1967.

8. It is recommended that no project redirection be taken until 25X1A the results of [redacted] current effort is analyzed, they be allowed to make their presentation on 6 September 1967, and additional data is obtained on the 409A (M) comparator which has been operational in excess of 80% of the time within the last three weeks.

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9. The present location and status of the six comparators are as follows:

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	[redacted]	Status
Prototype 405A (M)		Operational
Production 405B		Not Operational - (Interferometer)
Production 405B		Modification
Production 405B		Modification
Production 405B		Not Operational - (Interferometer)
Production 405B		Not Operational - (Interferometer)

[redacted]

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Distribution:
1 - Addressee
1 - NPIC/A/PA
1 - NPIC/C/TID
1 - DDI/C/IAS
1 - DIAAP-SC2
2 - NPIC/A/TD

25X1A [redacted]

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